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Memorandum

SUBJECT: HED's Reassessment of the Use of ORETf Granular Push-Type Spreader Studies (LCO and Homeowner -- MRID No. 449722-01) for the Trichlorfon Risk Assessment. PC Code 057901. DP Barcode D270174.

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Executive Summary

Attached is additional information for the trichlorfon RED. The revision to the granular push-type spreader exposure scenario using the Outdoor Residential Exposure Task Force (ORETF) data is necessary because at the time of the last revision (D268695) only the lawn care operator (LCO) granular study was available to the reviewer. Based on a conference call with Bayer Inc. on October 16, 2000, it was learned that a second study specifically designed for homeowner granular push-type spreaders had also been conducted. This memo updates both the LCO and homeowner risks for push-type granular spreaders. The results of the exposure and risk assessment are presented in Table 1.

Summary

Three handler scenarios are updated in this memo using the data from two ORETF studies. The scenarios, as numbered in the trichlorfon RED, are (R1) residential loading/-applying granules to building perimeters using a “push-type” broadcast spreader; (R2) residential loading/applying granules to residential lawns using a “push-type” broadcast spreader; and (8) loading/applying granules to lawns by LCOs. The handler scenarios are presented in Table 1. The exposure scenario for homeowners assumed that they wear only short sleeved shirts and short pants. The LCO exposure scenario is assessed at baseline: long sleeved shirt, long pants, no gloves, and no respirator. A summary of each study is provided below.

The residential estimate is based on a homeowner-specific granular push-type spreader study (MRID 449722-01. *ORETF Study No. OMA003 -- A Generic Evaluation of Homeowner Exposure Associated with Granular Turf Pesticide Handling and Application to Residential Lawns*). This ORETF study monitored a surrogate compound (i.e., dacthal). Thirty replicates of test subjects were monitored while wearing various whole body dosimeters such that a clothing scenario of short-sleeved shirt and short pants could be estimated. The test subjects loaded and applied two 25 pound bags with a rotary type spreader to a 10,000 ft² lawn at a rate of 1.9 lb ai/acre. The average application time was 22 minutes. Each replicate handled approximately 0.45 lb ai.

The LCO estimate is also based on an ORETF study (MRID 449722-01. *ORETF Study No. OMA001 -- Exposure of Professional Lawn Care Workers During the Mixing, Loading, and Application of Granular Turf Pesticides Utilizing a Surrogate Compound*). This ORETF study also monitored the same surrogate compound. Twenty test subjects were monitored while wearing chemical resistant gloves and another 20 test subjects were monitored while wearing no gloves. This study monitored test subjects applying a granular product packaged in 50 pound bags using a LESCO push rotary spreader. Various passive dosimetry techniques were employed to estimate both long pants and long sleeved shirts as well as short pants and short sleeved shirts.

The area treated per day in this risk assessment was assumed to be 0.5 and 5 acres for turf broadcast applications for homeowners and LCOs, respectively. The homeowner perimeter treatment is assumed to cover an area of 700 sq. ft. Calculations were made using only the maximum application rates because the MOEs are above the target uncertainty factors.

The short-term risk estimates for homeowners is presented in Table 1. In summary, the combined total MOEs are greater than 1,000 for homeowners and greater than 100 for occupational handlers.

Table 1. Residential and LCO Dermal, Inhalation, and Total MOEs for Trichlorfon Based on ORETF Data.

Exposure Scenario (Scenario numbers correspond with the trichlorfon RED)	Dermal Unit Exposure ^a (mg/lb ai)	Inhalation Unit Exposure ^b (µg/lb ai)	Use ^c	Application Rate ^d (lb ai/acre)	Amount Handled per Day ^e	Dermal ^{f,g}		Inhalation ^{h,i}		Combined ^j MOE*
						Daily Dose ^f (mg/kg/day)	MOE ^g	Daily Dose ^h (mg/kg/day)	MOE ⁱ	
Mixer/Loader/Applicator Risks: Residential Granular Push-Type Spreader (short-sleeved shirt, short pants, no gloves). MOE of 1,000 Needed for Both Dermal and Inhalation.										
Loading/Applying with a Push Type Spreader (R1)	0.68 (7.6 max)	0.91 (3.7)	perimeter	0.000062 lb ai/ft ²	700 ft ²	0.00042	240,000	5.6E-7	6E+6	230,000
Loading/Applying with a Push Type Spreader (R2)			turf	8.2 lb ai/acre	0.5 acres	0.040	2,500	0.000053	65,000	2,400
Mixer/Loader/Applicator Risks: Lawn Care Operator (LCO) Granular Push-Type Spreader (long-sleeved shirt, long pants, no gloves). MOE of 100 Needed for Both Dermal and Inhalation.										
Loading/Applying Granulars with a Push Type Spreader (8)	0.31 (max 2.1)	7.1 (max 29)	turf	8.2 lb ai/acre	5 acres	0.18	550	0.0042	830	330

Footnotes:

a,b Dermal and inhalation unit exposure values from the Outdoor Residential Exposure Task Force (ORETF). Residential dermal exposure assumes short pants, short sleeved shirt, and no gloves. LCO dermal exposures assumes long-sleeved shirt, long pants, no gloves and no respirator.

c "Use" indicates scenarios of a perimeter treatment around the foundation of the house and a broadcast turf application.

d Application rates are the high and low application rates presented on EPA registered labels. Rates are taken from the following labels:

R1: perimeter Reg. Nos. 3125-400 and 655-791; turf, 3125-507 and 3125-400, and

R2: perimeter Reg. Nos. 655-790 and 655-791.

e Amount handled per day values are EPA estimates of acreage treated found in the Residential SOPs draft December 1997. Perimeter area treated is based on a house 30 x 40 x 30 x 40 feet and a 5 foot wide band.

f Dermal daily dose (mg/kg/day) = daily unit exposure (mg/lb ai) x application rate (lb ai/acre) x amount handled per day (acres) / body weight (70 kg).

g Dermal MOE = dermal NOAEL (100 mg/kg) / daily dose (mg/kg/day). Target MOE of 1,000 for residential uses and 100 for occupational handlers.

h Inhalation daily dose (mg/kg/day) = inhalation unit exposure (µg/lb ai) x application rate (lb ai/acre) x amount handled per day (acres) x conversion factor (1 mg/1,000 µg) / body weight (70 kg).

i Inhalation MOE = NOAEL (3.45 mg/kg/day) / daily dose (mg/kg/day). Target MOE of 1,000 for residential uses and 100 for occupational handlers.

j Total MOE = 1 / [(1 / dermal MOE) + (1 / inhalation MOE)].



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